Chapter 2 Study Guide

# Important Ideas

* Atoms make up four main groups of molecules in living cells. (Modules 2.1-2.16)

# Learning Objectives

Upon successful completion of Chapter 2 you will be able to Differentiate between an atom and an element.

1. Given appropriate information, draw examples of atoms using the electron shell model.
2. Use the periodic table to determine an atom’s atomic number, atomic mass, and number of electrons, and describe the relationship between atomic number and atomic mass.
3. Solve problems involving atoms in the following scenarios:
   1. Changing the number of neutrons (Isotopes)
   2. Changing the number of electrons (Ions)
4. Define and differentiate between an atom, a molecule, ion, isotope, and radioactive isotope.
5. Describe how the theme of emergent properties applies to the formation of a compound.
6. Describe the subatomic basis for chemical bond formation (=what subatomic particles are important for the process of bond formation).
7. Compare and contrast ionic and covalent bonds.
8. Define the following terms: electronegativity, polar covalent bond, ion, nonpolar covalent bond, and ionic bond.
9. Determine the types of bonds formed in molecules such as
   1. O2
   2. NaCl
   3. CH4
   4. H2O
10. Describe and recognize examples of the properties of water emerged by the formation of hydrogen bonds between water molecules.
11. Define and interrelate the following terms: acid, base, pH scale, and buffer.
12. Given a pH of a particular solution, determine if that solution is acidic, basic, or neutral.
13. Define and interrelate the terms solute, solvent, and solution.
14. Define and interrelate the following terms: chemical reaction, reactants, products, and conservation of matter\*.

\* This topic is **not** covered in the book. Please consult your reading guide or class notes.